AMENDMENTS TO THE SPECIFICATION

The Applicant has provided amended replacement drawings for Figures 3A, 3B and 4.

The following is a listing of the replacement paragraphs for the specification including amendments currently entered as highlighted. The paragraphs are numbered as in the published patent application US 2004/0167673 and NOT according to the paragraph numbering in the physical application as filed.

[0030] The power supply unit 10 is provided with a power switch 13 for controlling an on/off operation of an AC power supply provided from a power input terminal 11, a power fuse 15 ~~13~~, connected to the power switch 13, for intercepting the power if overcurrent is supplied from the power input terminal 11 or an abnormal current flows from the outside, a capacitor C1, connected in parallel to the power switch 13, for removing a power noise component of the AC power supply inputted from the power input terminal 11, a varistor ZNR1, connected in parallel to the capacitor C1, to intercept overvoltage, a power transformer 17, connected in parallel to the varistor ZNR1, for receiving the AC power supply inputted from the power input terminal 11 to its primary winding, and inducing an AC voltage of a predetermined low voltage on its secondary winding, a smoothing capacitor C2 for removing a noise component contained in the AC voltage induced in the power transformer 17, a bridge rectifier 19 for full-wave-rectifying the AC voltage lowered by the power transformer 17 to output a DC voltage of a predetermined level (for example, 12V), smoothing capacitors C3 to C5, connected to an output terminal of the bridge rectifier 19, for removing a ripple component (i.e., low-frequency component) and a noise component (i.e., high-frequency component) contained in the DC voltage rectified by the bridge rectifier 19, a voltage regulator IC1 for regulating the DC voltage filtered through the smoothing capacitors C3 to C5 to output a constant DC voltage of a predetermined level (for example, 12V), and smoothing capacitors C6 to C8, connected to an output terminal of the voltage regulator IC1, for removing a ripple component and a noise component contained in a constant voltage outputted from the voltage regulator IC1.

[0034] The solenoid valve driving unit 40 controls the driving of a solenoid 41 under the control of the microcomputer 130 so that the solenoid valve supplies or intercepts the supply of fuel contained in a fuel tank (not illustrated) to the burner 30. The solenoid valve driving unit 40 is provided with a transistor TR3 for performing a switching operation according to the control signal outputted from the microcomputer 130, a relay RY3, connected to the transistor TR3, for being driven by the DC voltage (12V) outputted from the power supply unit 10 in accordance with the switching operation of the transistor TR3, and a solenoid valve 41,connectd to the relay RY3, for being driven by the AC power supply from the power input terminal 11 in accordance with the driving of the relay RY3. Also, a voltage dividing resistor for dividing the control signal outputted from the microcomputer 130 is connected to the transistor TR3, and a diode D7 for protecting the relay is connected in parallel to the relay RY3 in order to bypass an inverse electromotive force (EMF) generated during

the driving of the relay RY3. A thermostat (e.g., buzzer generating unit 120) is connected between the relay RY3 and the solenoid valve 41. A spark killer 63 absorbs noise generated from the contact of relay RY1.

[0042] Meanwhile, ~~the temperature sensing unit 90~~ another temperature sending unit may sense a burner temperature Tb that changes according to the driving of the burner 30.

[0047] The buzzer generating unit 120 generates a buzzer sound under the control of the microcomputer 130 when the user sets the indoor temperature using the encoder switch 21 or an error occurs in the igniter 51, thermistor RTH, burner 30, encoder switch 21, etc. The buzzer generating unit 120 is provided with a buzzer 121 for receiving the control signal outputted from the microcomputer 130 through resistors R19 and R20 and generating the buzzer sound, and an LED LED2, which is ~~for~~ turned on/off in accordance with the control signal inputted from the microcomputer 130 through a resistor R19 during the driving of the buzzer 121.

[0048] The microcomputer 130 performs a control operation so as to maintain the indoor temperature in the range of -30° C to 50° C. by comparing the indoor temperature inputted in real time from the temperature sensing unit 90 with the digital set temperature of 4 bits inputted from the temperature setting unit 20. In order to prevent the load that includes the solenoid valve, the igniter and the fan motor from being frequently turned on/off, the microcomputer 130 performs the control operation in such a manner that if the indoor temperature is lower than the set temperature by ~~less~~ more than 2° C ~~-2° C.~~, it turns on the load, while if the indoor temperature is higher than the set temperature by more than +1° C., it turns off the load.

[0050] At this time, if the indoor temperature transferred from the temperature sensing unit 90 becomes lower than the temperature set by the user by ~~less~~ more than 2° C ~~-2° C.~~, the microcomputer 130 drives the burner 30 by controlling the driving of the solenoid valve 41, the igniter 51 and the fan motor 61. Accordingly, the indoor temperature Tr rises.

[0055] The AC supply voltage lowered by the power transformer 17 is full-wave-rectified to a specified DC voltage (for example, 12V) through the bridge rectifier 19, and then the rectified DC voltage is filtered through the capacitors C3 to C5 to remove a ripple component and a noise component contained in the rectified DC voltage. (S20)

[0063] If it is determined that the 4-bit digital signal inputted from the encoder switch 21 is normal, the thermistor RTH of the temperature sensing unit 90 senses in real time the resistance value according to the indoor temperature Tr, and inputs the resistance value ofa the resistor R2 and the thermistor RTH that changes in accordance with the resistance value of the thermistor RTH to the microcomputer 130 to the resistor R1 (S70).

[0065] If it is determined that the voltage value inputted from the thermistor RTH is normal, the microcomputer 130 determines whether the indoor temperature Tr inputted from the temperature sensing unit 90 is lower than the set temperature Ts by

~~less~~ more than a predetermined value T.sup.1 (for example, 2^0 C ~~2^0 C.~~) by comparing the indoor temperature Tr with the set temperature Ts (S90).

[0066] If it is determined that the indoor temperature Tr is not lower than the set temperature Ts by ~~less~~ more than the value T^1 (for example, 2^0 C ~~2^0 C.~~), the microcomputer 130 returns to step S70, and repeatedly performs the steps following step S70 as it continuously senses the indoor temperature Tr.

[0067] Meanwhile, if it is determined that the indoor temperature Tr is lower than the set temperature Ts by ~~less~~ more than the value T^1 (for example, 2^0 C ~~2^0 C.~~), the microcomputer 130 outputs the control signal to the igniter driving unit 50 to start the combustion operation of the heater.

[0078] If it is determined that the initial ignition or the continuous combustion operation is normal, the microcomputer determines whether an error occurs (whether the temperature of the burner is higher than the maximum temperature of the burner by more than 30^0 C.) by sensing the internal temperature Tb of the burner 30, which rises corresponding to the combustion operation of the burner 30, through ~~the temperature sensing unit 90~~ another temperature sensing unit, and if it is determined that the error occurs, the microcomputer 130 enters into an error-4 mode due to the overheat of the burner 30 (S160 to S170).

[0080] The microcomputer 130 determines whether the indoor temperature Tr inputted from the temperature sensing unit 90 is higher than the set temperature Ts by more than a predetermined value T^2 ~~T^1~~ (for example, $+1^0$ C.) by comparing the indoor temperature Tr with the set temperature Ts (S190).

[0081] If it is determined that the indoor temperature Tr inputted from the temperature sensing unit 90 is not higher than the set temperature Ts by more than the predetermined value T^2 ~~T^1~~ (for example, $+1^0$ C.), the microcomputer 130 returns to step S180 and repeatedly performs the steps following step S180 as it continuously senses the indoor temperature Tr.

[0082] Meanwhile, if it is determined that the indoor temperature Tr is higher than the set temperature Ts by more than the value T^2 ~~T^1~~ (for example, $+1^0$ C) the microcomputer 130 outputs the control signal to the solenoid valve driving unit 40 to stop the combustion operation of the heater.

[0092] At this time, in order to prevent the load of the heater composed of the igniter, solenoid valve and fan motor from being frequently turned on/off, the microcomputer 130 sets an operation condition of the heater so that the heater is turned on if the indoor temperature is lower than the set temperature by ~~less~~ more than 2^0 C ~~2^0 C~~ and turned off if the indoor temperature is higher than the set temperature by more than 1^0 C.

[0108] The microcomputer 130 determines whether the predetermined time tb elapses by counting an on time of the power LED LED1, and if the predetermined time tb elapses, the microcomputer 130 clears the time counter again (S88 to S89 ~~S149~~), and then returns to step S84 to repeatedly perform the steps following step S84.